

Title (en)

LITHIUM COBALT OXIDES AND METHODS OF MAKING SAME

Title (de)

LITHIUM KOBALTOXIDE UND VERFAHREN ZUR HERSTELLUNG

Title (fr)

OXYDES DE LITHIUM-COBALT ET LEURS PROCEDES DE PREPARATION

Publication

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Application

**EP 00982491 A 20001207**

Priority

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Abstract (en)

[origin: WO0142141A1] The present invention includes lithium cobalt oxides having hexagonal layered crystal structures and methods of making same. The lithium cobalt oxides of the invention have the formula  $\text{Li}_w\text{Co}_{1-x}\text{A}_x\text{O}_{2+y}$  wherein  $0.96 \leq w \leq 1.05$ ,  $0 \leq x \leq 0.05$ ,  $-0.02 \leq y \leq 0.02$  and A is one or more dopants. The lithium cobalt oxides of the invention preferably have a position within the principal component space defined by the relationship  $\text{axi} + \text{byi} \leq c$ , wherein  $\text{xi} = \text{i.Pcl}$ ;  $\text{yi} = \text{Si.Pc2}$ ; the vector Si is the x-ray spectrum for the  $\text{Li}_w\text{Co}_{1-x}\text{A}_x\text{O}_{2+y}$  compound; the vectors Pcl and Pc2 defining the principal component space are determined by measuring the x-ray powder diffraction values Si between 15 DEG and 120 DEG using a 0.02 DEG step size and CuK alpha rays for a large sample set of lithium cobalt oxides and using the regression of Si of the sample set against the capacity fade after 50 cycles of a lithium coin cell that includes a lithium negative electrode and the lithium cobalt oxide as the positive electrode material and that is cycled between 3.0 and 4.3V at a constant current of C/3 during both charge and discharge cycles; and the values a, b and c are determined by using only the xi and yi values for  $\text{Li}_w\text{Co}_{1-x}\text{A}_x\text{O}_{2+y}$  compounds in the sample set that have a capacity fade after 50 cycles of less than or equal to 15 %.

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